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Production of Pumpkins and Squashes

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U. S. DEPARTMENT OF AGRICULTU

PRODUCTION OF PUMPKINS AND SQUASHES

By Ross C. Thompson, *associate horticulturist, Division of Fruit and Vegetable Crops and Diseases, Bureau of Plant Industry*

Pumpkins and squashes are among the few food plants considered to be natives of America. They are known to have been used by the North American Indians before the advent of the European settlers. Both are nutritious and valuable vegetable crops and have many and varied uses. In addition to their use as fresh vegetables, a large tonnage of pumpkin and squash is canned each year, the canned product being used largely for pie making. If properly handled and stored, a supply may be had from midsummer to late spring.

Climatic and Soil Requirements

Pumpkins and squashes can be grown for local use in all parts of the United States, but their large-scale commercial production is limited mainly to the East, where the climatic conditions are more favorable. The States having the largest acreage devoted to squash production are Massachusetts, California, New York, and Michigan, while California, Iowa, New York, and New Jersey have the largest acreage devoted to the growing of pumpkins.

Almost any good garden soil will grow these crops. While a soil of medium texture is perhaps best, good yields can be produced on the heavier and lighter soils, if properly handled and well-fertilized. A light rich soil that warms up rapidly is best where the summer varieties are grown for the early market. Good drainage is essential, as these crops will not tolerate a wet, poorly ventilated soil.

Although not very sensitive to soil reaction, they do best on soils only slightly acid or nearly neutral. Extremely acid soils should be avoided. Moderately acid soils should be limed at the rate of 1,000 to 1,500 pounds per acre, depending on the degree of acidity. Good yields of these crops are produced on some of the slightly alkaline soils of the West.

Varieties

Botanically, the pumpkins and squashes belong to three species, *Cucurbita pepo*, *C. moschata*, and *C. maxima*. The pumpkins belong to the first two species, and the true squashes to the last-named. Most of the common varieties of pumpkins belong to *C. pepo*, but a few of the popular varieties such as Large Cheese and the Cushaws belong to *C. moschata*.

In the past it has been the practice of seedsmen to list the Summer Crookneck, the Vegetable Marrow, and the Bush Scallop or Pattypan, known in the South as the cymling, as summer squashes. These all belong to the species *Cucurbita pepo* and are in reality true pumpkins.

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This situation has led to general confusion among growers as to which varieties are squashes and which are pumpkins. The tendency now is to name them according to their botanical classification. This means that the Summer Crookneck, Bush Scallop, and Vegetable Marrow should be called pumpkins. The character of the fruit stem makes it possible to readily distinguish the pumpkins from the squashes. The true squashes at maturity have soft spongy fruit stems which are not noticeably ridged or furrowed, whereas the fruit stem of the pumpkin is very hard and woody, generally ridged or furrowed longitudinally, and often enlarged at the attachment to the fruit.

The most widely grown of the summer pumpkins are the Bush Scallop and the Crookneck. Of the Bush Scallop there are white-and yellow-skinned strains. The white-skinned ones are the most common. The Early White Bush Scallop or White Pattypan is one of the most popular of the summer pumpkins because of its fine quality and productiveness. There are several strains of the Crookneck. The Yellow Summer Crookneck is the most popular. The Straightneck Summer, a selection of the Crookneck which has been recently introduced, has a comparatively straight neck. This is considered an advantage in packing for shipment. The English Vegetable Marrow is a summer pumpkin of good quality much prized in England, but as yet little grown in this country. The Cocozelle and Zucchini are summer pumpkins of the vegetable-marrow type introduced from Italy and grown to some extent for the early market.

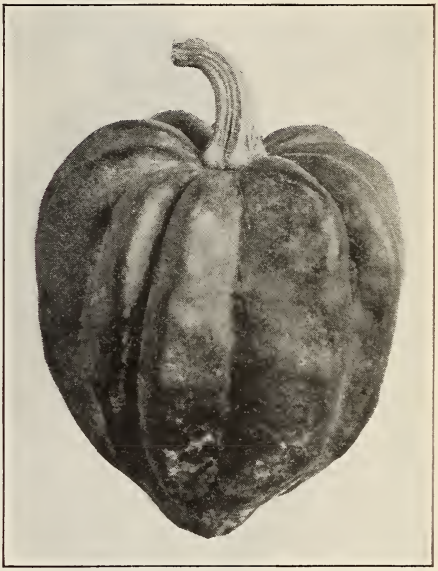

FIGURE 1.—Table Queen or Acorn pumpkin. Note the ridging of the stem longitudinally, which characterizes the Table Queen as a true pumpkin.

The summer pumpkins are best used when immature and while the rind is still soft. As they mature, the rind and seeds become hard, reducing their edibility. The Scallops and Crooknecks mature very rapidly and reach their prime within 3 to 5 days after the setting of the fruit; hence they should be harvested regularly and frequently. They are usually best while the skin or rind is tender enough so that it can be penetrated easily by slight pressure of the fingernail. The summer pumpkins are not especially desirable for pies or baking, but are best served boiled and mashed with butter or fried.

Among the best of the late pumpkins for table use are Small Sugar, Winter Luxury, Large Cheese, Cushaw, and Table Queen. The Table Queen, a recent introduction listed by seedsmen as Queen, Des Moines, and Acorn (fig. 1), is prized for its excellent baking qualities and for its convenient small size, being suitable for cutting in two pieces and serving as individual portions. The shell is dark green, hard, and slightly ridged longitudinally. The skin turns orange yellow or copper color in storage. The flesh is rich orange yellow. There is a growing demand for the Table Queen in some of the eastern markets. It keeps almost as well as the late squashes. The other varieties mentioned are all good table varieties suitable for pie making.

Pumpkins make excellent stock feed. Some of the large varieties, including Connecticut Field, Large Cheese, and some of the Cushaws, are used extensively for feeding.

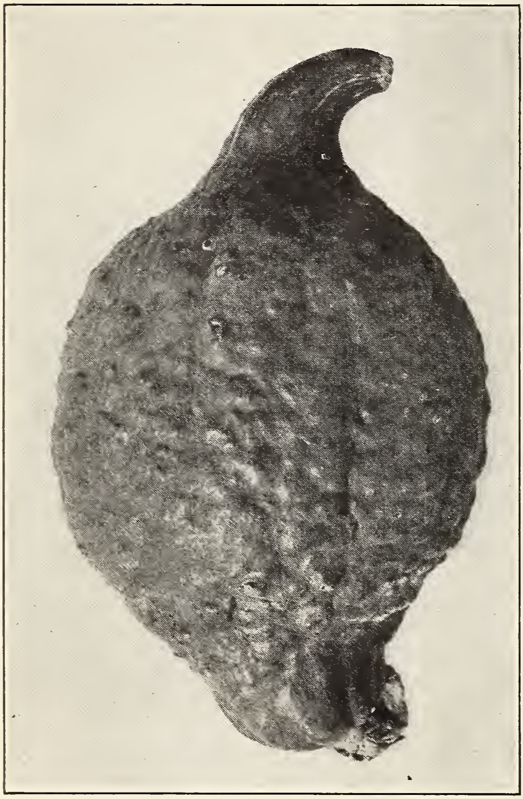

FIGURE 2.—Green Hubbard squash. Note that the stem is smooth. This characterizes it as a true squash.

The true squashes include the hard-shelled, late-maturing varieties, such as the Hubbard, Boston Marrow, and Delicious. The Boston Marrow should not be confused with the Vegetable Marrow already mentioned. There are several strains of Hubbard, including Golden Hubbard, Chicago Warted Hubbard, Blue Hubbard, Green Hubbard, and Kitchenette. The Chicago Warted Hubbard is the largest and most warted of the Hubbard group. The various Hubbards differ chiefly in color, size, and time of maturity. The Green Hubbard (fig. 2) is probably the most popular of the dark-skinned Hubbards. The Golden Hubbard is a little earlier than the Green Hubbard and has a rich, orange-colored skin. The Kitchenette is a selection from the Green Hubbard. It is smaller and therefore more desirable for family use. The Boston Marrow is shaped somewhat like the Hubbard, but is not so pointed at the blossom end, being more or less pear-shaped. The variety is often quite variable in size, shape, and quality. The Hubbards and Boston Marrows have good keeping qualities. The Delicious is regarded by many as the finest of all squashes in quality. The fruits are top-shaped and pointed at the blossom end. The skin is smooth and dark green. The very large squashes such as Genuine Mammoth and Mammoth Whale are rather coarse and poor in quality for table use. Although sometimes used for canning, they are grown principally for exhibition purposes and stock feed. It is one of these varieties that is usually grown for exhibition of size at county and State fairs.

Questions are often asked about the crossing or mixing of pumpkins and squashes when grown in the same field. All of the varieties within a species will mix or cross when grown close together. That is, all the varieties of *Cucurbita pepo* will cross with each other, as will the varieties within the species *C. moschata* and the varieties within *C. maxima.* There is little probability of varieties of *C. pepo* crossing with varieties of *C. maxima.* The varieties of *C. moschata* are likely to cross with varieties of either *C. pepo* or *C. maxima.* Pumpkins and squashes cannot be crossed with cucumbers, muskmelons, or watermelons.

Varieties for Canning

Squashes and pumpkins are both used for canning. The canned products are very similar, and both are used for pie making. The large-fruited and heavy-yielding varieties having yellow or light-colored rinds are the most desirable for canning. The green-skinned varieties are more difficult to handle so as to prevent the discoloration of the canned product by green tissue that may be missed in removing the rind. To meet the requirements of the commercial canning trade a variety must be a heavy yielder, and the fruits must have flesh of the proper color and texture. Flavor is not an important factor in the selection of canning varieties as it can be controlled to some extent by the canner. Tests made in using different varieties for pie making show that the flavor is so influenced by spices and other ingredients that the original flavor is not very important where the product is used for pies.

Among the pumpkin varieties most used are Large Cheese, Winter Luxury, Connecticut Field (fig. 3), and Cushaw; and of the squashes, the Boston Marrow and Golden Hubbard. Connecticut Field and Large Cheese are favored as canning sorts throughout the Middle West. Boston Marrow squash and Cushaw pumpkin are popular with eastern canners.

Squashes and pumpkins for canning are generally grown under contract with the canning company. The company usually furnishes the seed of the variety desired. The canner should be consulted before a large acreage of pumpkins or squashes is planted with the expectation that the canning company will handle the crop.

Culture

Like other cucurbits, squashes and pumpkins have a large but shallow root system. The root growth is very rapid and extensive in the upper 6 or 8 inches of soil. The character of the root systems requires that the upper layers of soil be thoroughly prepared and well-fertilized for best results. The soil should be well-supplied with organic matter and retentive of soil moisture. A surface soil capable of retaining its moisture content is especially desirable in localities where rainfall is likely to be deficient.

Pumpkins and squashes respond to liberal applications of fertilizer unless the soil previously has been heavily fertilized. Well decomposed stable manure is best and should be applied at the rate of 6 to 10 tons or more per acre when it can be obtained at a reasonable cost. Heavy applications of manure should be broadcast and plowed under in the fall. If the manure supply is limited to a few tons per acre, it can be used most efficiently by working it into the hills before planting. Manure applied in the hills should be well decomposed and thoroughly mixed with the soil. Manure which is not well rotted, especially strong manure like horse, poultry, or sheep manure, should not be used where it is to be applied in the hills at planting time.

Some of the eastern soils may respond to an application of complete commercial fertilizer in addition to animal manure. Superphosphate at the rate of 1,000 to 1,500 pounds per acre can be expected to return a profit, especially in the Middle West where the soil is likely to be deficient in phosphorus. In the irrigated sections of the West where the humus content of the soil is low, animal manure supplemented with a nitrogen fertilizer is likely to give the best results. Soils vary so greatly in their fertilizer requirements that little specific advice can be given as to the best fertilizer combination to use. This is largely a problem for the grower himself to determine.

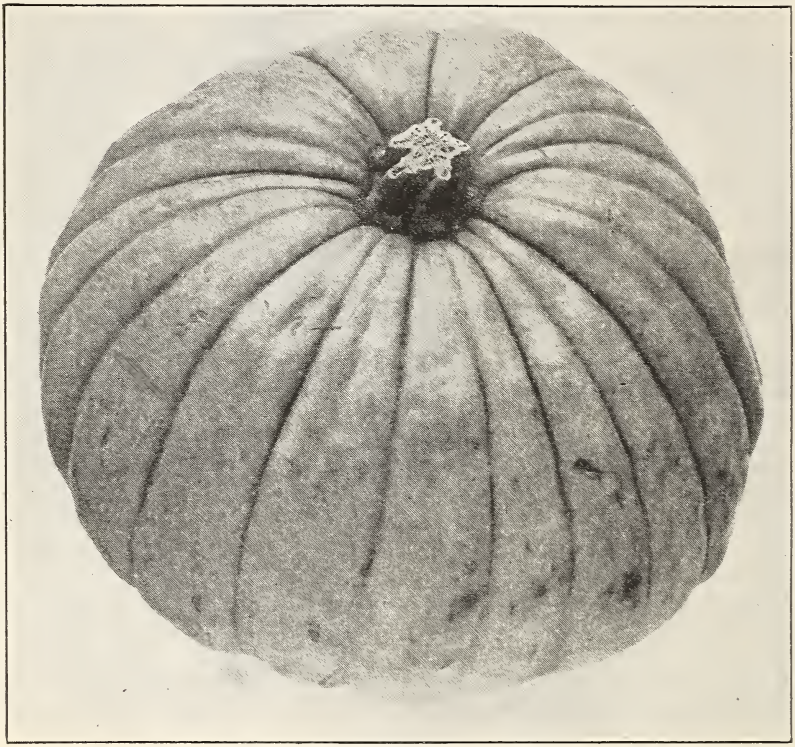

FIGURE 3.—Connecticut Field pumpkin.

Squashes and pumpkins are sensitive to frost; hence they should not be planted until danger of injury from low temperature is past. Like other cucurbit crops, they are difficult to transplant, and they are seldom started under glass for transplanting to the field. Where transplanting is attempted, the seedlings should be grown in individual containers (fig. 4), so that they can be moved with a considerable mass of soil about the roots. They will not stand transplanting if the soil is removed from the roots or if the roots are appreciably disturbed. Only the summer varieties can be transplanted profitably, and then only where an early product means an increased profit.

Planting should be delayed until the soil has warmed up and is in good condition for germination of the seed. The seed germinates best at a relatively high temperature and is likely to decay if planted in a cold, wet soil.

The bush and small-vine varieties may be planted in hills as close as 4 by 5 feet, but the varieties having long running vines should be spaced 8 to 12 feet apart each way, depending on the growth habit of the variety and the fertility of the soil.

The seed is sometimes planted in drills rather than in hills, and the seedlings thinned to about 4 feet apart in the row. This gives each individual plant a better chance for development.

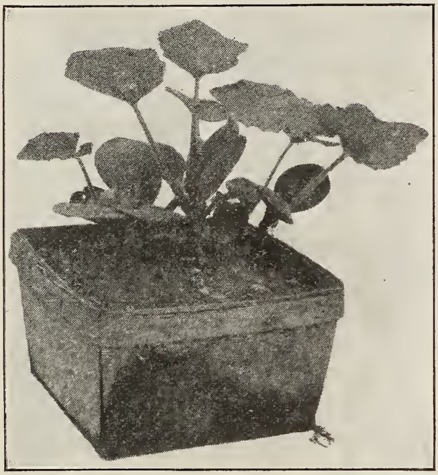

FIGURE 4.—Hill of summer squash started in a 1-quart strawberry box.

The amount of seed required to plant an acre varies from 2 to 4 pounds, depending on the size of the seeds and the planting distances. It is best to plant plenty of seed and to thin the plants to not more than three to a hill after danger from early attacks by insects is past. The seed should be covered to a depth of about 1½ inches. It may be covered a little deeper in light soils than in heavy soils, especially in those having a tendency to form a crust on the surface.

Cultivation should be shallow to avoid injuring the shallow roots. It is doubtful whether these crops should be cultivated more than is necessary to keep down weed growth. The removal of weeds by means of sweeps that cut just under the surface is preferable to using implements that stir the soil to greater depth.

Insects and Diseases

Information on the control of insects and diseases of these crops may be found in Farmers' Bulletin 1371, Diseases and Insects of Garden Vegetables, issued by the United States Department of Agriculture.

Curing and Storage

Only the hard-shelled squashes are adapted for long storage, but some of the pumpkins such as Table Queen, Large Cheese, and Small Sugar can be kept until after Christmas if properly handled. They should be well matured and carefully handled in harvesting and storing. Cuts and bruises in the rind are open to decay organisms that may cause a great deal of loss from rot in a short time. Under proper conditions wounded areas on both squashes and pumpkins are capable of healing over by producing suberized tissue, which gives protection against the entrance of rot organisms. This protecting tissue seems to develop best at a relatively high temperature and in a moist atmosphere. Good results have been obtained by curing pumpkins and squashes with stove or other artificial heat at a temperature of 85° to 90° F. with a relative humidity of about 80 percent for 10 days after harvesting. At the end of the 10-day period they should be put in a dry place and the temperature kept between 50° and 60°. It is essential that the surface be kept dry during the storage period. Temperatures above 60° tend to keep the respiration rate too high, and considerable loss through shrinkage results. Excessive loss of moisture impairs the quality.

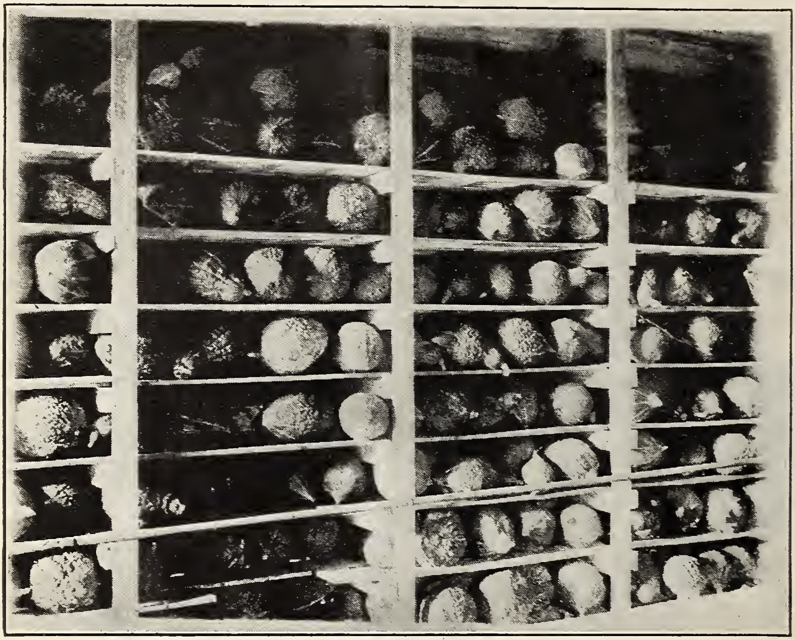

FIGURE 5.—Hubbard squashes stored on shelves.

Any dry place where the proper temperature can be maintained is suitable for the storage of squashes and pumpkins. They keep best when not piled on top of each other. A good method is to provide shelves where they can be spread out in a single layer with a small space between the fruits (fig. 5). Storing them in this manner greatly reduces the chances of loss from decay.

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